

M.O.T.D.

The OS-9 Users' Group Newsletter

May/June 1994

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From the President:

Here it is, April, and yet another Fest is looking us in the eye. Gosh, where does the time go? Seems like it was just a few weeks ago we were in Atlanta for the Fest there.

Elections will be held at this fest's meeting for the Board of Directors. To date no nominations have been received. I really would like to see more member response than I have towards these elections.

On to other items, though... April is normally a very nice month here in Chicago. That said, how come it is so cold? Things should warm up by fest-time, though!

At last count the Glenside Club has 20+ vendors signed up and PAID for the Fest in Chicago. **This is definately a Fest to attend!**

Even though it is called a *CoCoFest*, OSK and OS-9 (6809) are very well represented. Included as vendors are **Delmar** and **Blackhawk Enterprises**, so software and hardware for OSK is represented as well. Come see these computers in action!

No other news, so I have a request for the members of this *Users Group*. How about some feedback? What are you looking for from the *Users Group*? How can we help you as a member?

Until next issue, stay healthy and happy!

Carl J. Boll

MOTD Information

The OS-9 Users Group, Inc. is a not-for-profit organization, registered and incorporated in the state of Iowa, whose members share an interest in the OS-9 operating system in all of its various forms.

MOTD is the official newsletter of the *OS-9 Users Group, Inc.*

The OS-9 Users Group, Inc. has no affiliation with **Microware** or any other organization.

The opinions expressed by the authors of any articles or columns are not necessarily the opinions of the Editor, Publisher, columnist, nor do they reflect the policies of *The OS-9 Users Group, Inc.*

The **MOTD** will be printed a minimum of four times per year.

To receive **MOTD** you must be a member in good standing of *The OS-9 Users Group, Inc.* in accordance to the bylaws.

To become a member in good standing you must pay the yearly dues of \$25.00 US funds (\$30.00 US funds if you live outside the US and Canada) and obey all of the membership rules set forth in the Constitution of The Users Group and the bylaws.

Dues may be made payable to:

**The OS-9 Users Group
6158 West 63rd Street
Suite 109
Chicago, IL 60638
U.S.A.**

Memberships run from January 1st through December 31st. Send a SASE for a membership kit which will include a membership form and information about the Users Group as well as a pro-rated price for joining the Users Group in mid year.

Please remember that this is a self help organization, and also a non-profit organization incorporated in the state of Iowa and as such it is directly governed by the laws of that state as well as all federal laws. Accordingly, dues are non-refundable in accordance with both state and federal law.

Reprints or back issues of the **MOTD** are available to members in good standing at the cost of \$1.50 each plus \$0.50 shipping (US funds). Please send a SASE and a list of the issues you wish sent to you.

Here is a list of the current officers of *The OS-9 Users Group, Inc.*:

<u>Position</u>	<u>Name</u>
President	Carl J. Boll
Executive Vice Pres.	Colin McKay
Vice Pres. (6809)	Brian Goers
Vice Pres. (68K)	Eddie Kuns
Vice Pres. (Comm.)	Paul Jerkatis
Treasurer	Brother Jeremy
Secretary	Howard Luckey
Librarian	Zack Sessions
M.O.T.D. Editor	Joel Mathew Hegberg

MOTD Contributions

Articles, editorials, "letters to the Editor/Board of Directors", personal ads, graphics, or columns may be submitted by using the following means:

E-mail to JoelHegberg@delphi.com, E-mail to 'Sysop' of SandV BBS [(708) 352-0948], or by mail to *The OS-9 Users Group* address in Chicago. All submissions should be in pure ASCII format.

The submission of material does not guarantee publication. All publication of material is subject to review by the Board of Directors and the MOTD Editor, and must not be in conflict with the stated purposes of the Users Group as defined by the constitution and bylaws of the Users Group. The Board of Directors may also establish additional guidelines for acceptance to publication. Submission deadlines are four weeks before actual printing of the MOTD issue. *All printed material is subject to nominal editing by the MOTD Editor for clarity.*

Criticism towards making MOTD a better publication is welcome. Letters may be addressed to the MOTD Editor and mailed to the Users Group address or sent directly to JoelHegberg@delphi.com. E-Mail can also be sent to the following Delphi members: MITHELEN, CBJ, LUCKYONE, BRIANGOERS, EDDIEKUNS, and COLORSYSTEMS.

MOTD Advertising

Commercial advertising is available in **MOTD**. Please send a SASE for current rates. All ads should be submitted as a camera ready copy. We reserve the right to limit the size and quantity of ads.

SandV BBS (708) 352-0948

The SandV BBS is a BBS being maintained by Paul Jerkatis to provide Internet access.

Straight From the Horse's Mouth

by Colin McKay

First, a quick update on the SAMPIE Project that was described in my last column. The experiment went up on the Space Shuttle Columbia in March. Just to refresh your memories, the Solar Array Module Plasma Interaction Experiment tested the behavior of a number of solar cell designs in the space environment. The cells will be used on the Space Station, as well as future spacecraft and satellites. I received the following message from the Software Engineer for the project, David Stang, after Columbia's landing:

Hi, Colin:

The experiment was a success! We didn't exactly follow the planned scenario but things turned out quite well. The project scientists are very pleased with the results.

The software worked flawlessly, of course!

I will be going to Florida next week to retrieve the on-board data, but what we got from the downlink indicates a very productive effort. The scientists are excited about it because the solar cells behaved very differently in space compared to vacuum-tank tests. Also the space environment looks different from theoretical predictions.

I don't know if I mentioned this before, but I found out that another experiment on the same flight also used OS-9. It was "Zeno" on the USMP payload, I think it came from the University of Maryland.

...David

Zeno, named for the Greek philosopher who first contemplated the nature of infinity, was the *Critical Fluid Light Scattering Experiment*. It measured the physical properties that occur in a fluid that is heated, under high pressure, very close to its critical point, where both liquid and gas co-exist. The fluid used was liquid xenon. Zeno flew as part of the *US Microgravity Payload 2*.)

Now on to this column's feature. Thanks to Drew Bennett for providing most of the information used in this article. Drew was on staff at MIT, and is now attending MIT as a Grad Student working on his Ph.D. in Ocean Engineering, specializing in AI and Intelligent Control Systems.

Massachusetts Institute of Technology Sea Grant Project
Autonomous Underwater Vehicle

The *MIT Sea Grant Project* is involved in the early stages of research which may eventually be able to monitor entire oceans. *Autonomous Underwater Vehicles* (AUVs) will roam the oceans.

performing a variety of tasks. Tracking fish stocks, detecting and finding sources of environmental pollution, supporting search and salvage operations, and performing oceanographic research are just a few of the potential tasks for AUVs.

These AUVs will roam the oceans unattended, relaying their findings back to communications nodes. The communications nodes will then relay the information back to *Base Stations*. The AUVs will return to the communications nodes whenever they need to recharge their batteries.

AUVs are unmanned submarines with their own navigation systems, and a variety of sensory systems which may vary from vehicle to vehicle and mission to mission. The project needed a real-time operating system to control the AUVs. ***On the recommendation of the Naval Postgraduate School, OS-9 was chosen by the MIT Sea Grant Project.*** Most Unix-literate members of the project have been able to pick up the basics of OS-9 in about a day.

Software is developed on a variety of OS-9-based systems, linked together in a network. OS-9 68000 v2.4 is currently being used. OS-9 v3.0 is being considered for purchase later this year. Further field testing of the current system will take place at the Juan de Fuca Ridge off Seattle during the coming summer months.

Now that they've been using OS-9 for a while, the following have been identified as problem areas:

- IO events that hang the system, necessitating a reboot. This can really be a problem with multiple users on the system;
- Processes that die, but remain in the process map;
- Compiler bug (since fixed in v3.0); and
- System security, notably the un-encrypted password file.
(Note: I've suggested EFFO's encrypted password login package or MTSMON.- Colin.)

Development stations:

One GESPAC 68020 system with 8MB of memory, a 120MB hard disk, a 3.5-inch floppy drive, a 5.25-inch floppy drive, ethernet, a multi-function interface card driving a keyboard, mouse and VGA monitor, a 4-port serial card and a 2-serial and 1-parallel card. The boards are mounted in a card cage which is in turn mounted in a modified tower-style PC case.

One OR Systems 68030, 4MB system with a 240MB SCSI hard disk, a 3.5-inch SCSI/Floppy drive, a 12-bit A/D board, an 8-port serial card and an ethernet card. This system is mounted such that it can be easily installed in a variety of locations for portability.

Software for the GESPAC is the OS-9 Professional v2.4, with the addition of the Ultra-C compiler and G-Windows. The OR also uses OS-9 Professional v2.4, with the addition of the gnu C++ compiler. Modifications to the system software are kept to a minimum to facilitate upgrades, and to maintain hardware independence.

Vehicle Computers:

One OR Systems 68030 system, identical to the one above, but without the floppy drive.

One GESPAC 68000 system with 512KB of RAM and various support boards running industrial OS-9 (this system is now retired).

Vehicle Software:

Due to the variety of configurations and mission profiles that an AUV may sent out on, the software is written to be as modular as possible.

The main process is a central core program (the dynamic controller) that must run at a certain rate to maintain control of the vehicle (fin & rudder commands must reach the servos at about 5 hertz). All other processes run independently in the remaining cycles.

All sensor and status information is kept in a memory module that is updated by the main process, in a "blackboard" system. Software modules read the sensors, and write the information to the "blackboard" module. That way, there is a standard method of accessing the information, so software modules (*called behaviors, patterned after Dr. Rodney Brooks' Behavior-Based AI research*) can then read the information as required from the "blackboard" module. Modules are stored on the hard disk and are launched and prioritized by a script created for the mission.

The idea is to make the vehicle a "plug-and-play" system for scientists to use. Ideally, it will someday be like a stereo system where hardware and software modules are plugged into the AUV, and the vehicle left to operate on its own.

Missions are run by determining what sensors and behaviors are needed, setting the appropriate parameters (maximum depth, duration, etc.) and then creating the script that controls the sequence of events. During a mission, behaviors are told what their parameters are and what constitutes successful completion (what the goals are for that phase of the mission). Some behaviors (safety behaviors, like depth, power or range limits) have no completion and run forever. Others, like waypoint behavior (go to this location and depth) have goals and tell the controlling script when they have met those goals. Once they have met their goals, the script fires off the next behavior(s) for the next phase. At any point, a safety behavior can seize control of the vehicle and return it to home.

In March one of their vehicles, ***Odyssey II***, was brought to the Arctic for testing. "Events" were located beneath the ice pack using hydrophones, and the AUV was dispatched to examine them.

One such example was the examination of two sections of the ice pack colliding, to form an underwater ridge. The event was then monitored using on-board sensors, and the information relayed back to the base station by Odyssey II.

Locating the event from the surface and safely dispatching human observers would have taken much longer, and the event probably would have been over. This is one of the big advantages of using AUVs rather than human observers. AUVs can be left unattended for long periods of time, waiting for events to occur, while human observers can wait in safety and comfort back at the base station.

Odyssey II is about 2.2 meters long, 0.6 meters in diameter, weighs 160 kilos and is teardrop shaped with a single thruster and cruciform control surfaces at the stern. The outer shell is made of polypropylene and is banana yellow in color for easy visibility. The fairing is free-flooding, and has two glass spheres as pressure-vessels for the batteries and electronics, which are rated for depths up to 6,000 meters.

On-board sensors include a compass, an attitude sensor (roll, pitch, yaw), three altimeter/range finder sonars looking down, forward and at 45 degrees (between down & forward), a pressure sensor (for depth), water speed sensor, a three-axis accelerometer, an acoustic modem for communications at about 600 baud, a "Trackpoint" system that gives bearing to a pinger of a specific frequency (for returning after a mission) and an independent pinger to track the AUV in the event that it fails.

"On the recommendation of the Naval Postgraduate School, OS-9 was chosen by the MIT Sea Grant Project."

Odyssey II is trimmed for slight positive buoyancy before a mission so it will surface in the event of a power failure. Forward motion and a slight dive angle on the fins keep the vessel submerged so long as there is power.

For deep water missions a drop-weight is carried. At the end of a mission, or in the event of a power failure, the drop weight is released, and the AUV floats to the surface.

Additional "strap-on" or "mission-specific" sensors include (but are not limited to) temperature and conductivity sensors, cameras (video and/or still) and a side-scan sonar.

Duration for a typical mission is 8-12 hours, at speeds of 2-3 knots. Maximum speed is about 5 knots. Adding an additional "battery sphere" increases the maximum duration to 33-36 hours. Exact duration depends on the speed of the vehicle and use of on board sensors and systems.

There is a brief article describing Odyssey II and the Sea Grant Project entitled "Ice Inspector" on page 23 of the March 1994 issue of Popular Science.

A variety of systems are used for navigation of the AUV. GPS is not available due to the requirement to keep an antenna out of the water to receive the satellite signals. Systems that are used include:

- Long-Baseline (LBL) systems, which basically work like LORAN for ships - this system is most commonly used by the AUVs;
- Ultra-Short Baseline (USBL) systems (it works like your ears to tell the direction of sound),
- Dead Reckoning, from the on-board instruments; and
- Feature-relevant navigation.

The last method comes in two flavors: the conventional way is to look for previously mapped terrain and figure out where you are in relation to a known feature. The second is based on the thesis of one of the scientists at MIT; you keep maps of multiple types of features and use them to determine where you are by process of elimination. For example: "If the temperature is this, and the salinity is that, and the bottom is at this depth, then I must be either here or there. But I can't travel fast enough to be there, so I must be here."

Computers in Progress:

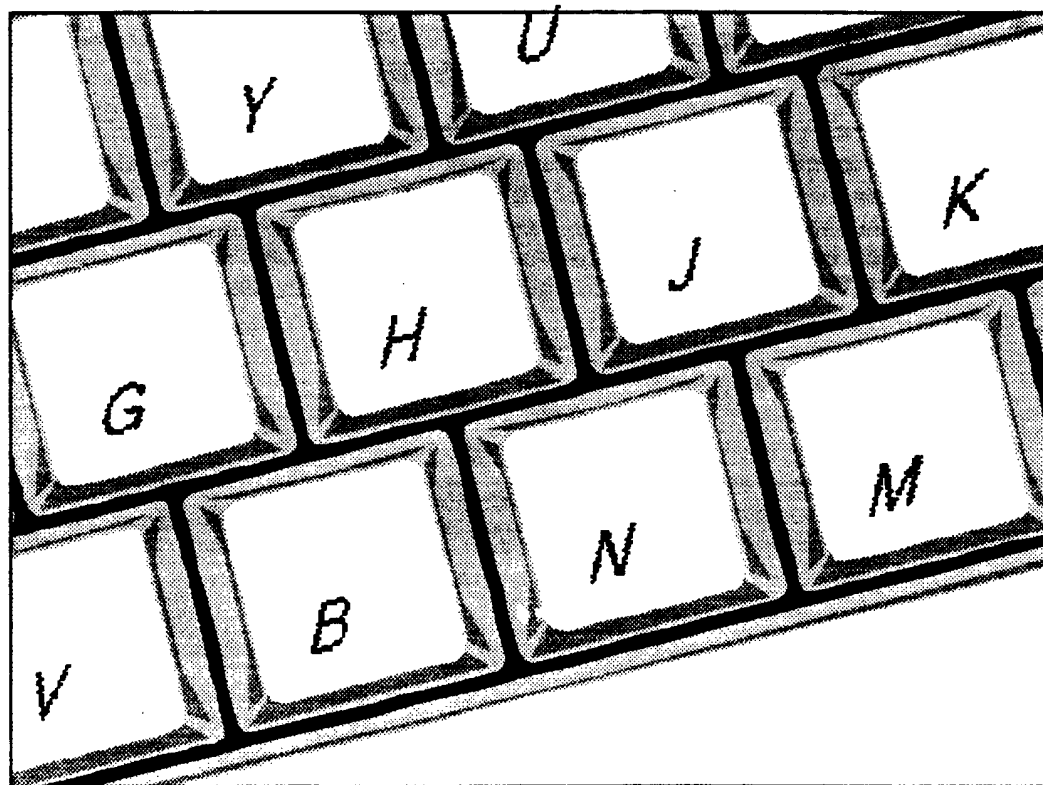
Members of Sea Grant are actively porting OS-9 to a "TattleTale-7", made by Onset Technologies of Bourne, MA. They make 68332-based computer systems for use in data-recording systems. The computers (with a 20MB hard drive) are about the size of two decks of cards laying side-by-side and use very little power. The system has been run for about 45 minutes using just a 9 volt transistor battery!

This computer will be installed in a *robot lobster*, which is designed to research chemical plume-following capabilities. Their oldest vehicle, **Sea Squirt**, will also be retrofitted with the same computer. A new *Autonomous Surface Vessel* (ASV) and a micro-sized submersible using the same computing system are also planned.

The ASV will include both a computer control system, and a Radio Control (RC) system. Control may be switched at any time between the on-board computer and the RC system. Work on the ASV is nearing completion.

That's it for this column. Look for me and other members of the OS-9 Users Group manning our booth at the upcoming Fest in Chicago. Additional details about the Fest are published elsewhere in this MOTD. See you next issue!

Colin McKay



Editor's Log

As many of you know through reading my past articles and from talking with me, I'm anxiously awaiting this month's Chicago CoCo/OS-9 Fest! There's just something special about the annual Chicago fest that makes it exciting. Last year's show was a huge success, and it looks like this year's show will be just as great. So far, I count 27 vendors who will be attending the show, each one bringing several new items for us to see, play with, and buy! Here's a list of vendors planning to attend:

Barsoft, ColorSystems, DELMAR, Hawksoft, Farna Systems, Crystal Palace BBS, DISTO, Budgetware, JWT Enterprises, Adventure Survivors, The Chicago OS9 User's Group, The National OS9 User's Group (*that's us!*), StrongWare, SBUG, Blackhawk Enterprises, Northern Xposure, Dirt Cheap Computer Stuff Co., Glenside Color Computer Club of Illinois, JoTA Productions, Frank Hogg Laboratories, Digigrade Productions, Ken-Ton Electronics Inc, Kala Software, CoNect, Animajik, Sub-Etha Software, and DALTRUG.

The **Glenside Color Computer Club** is working very hard to make sure this show comes off an even bigger success than the last one. With so many dedicated and talented people working on this task, and with a proven track record to boot, I have every confidence this will be a fest to remember! I hope to see as many of you there as can make it. See the fest advertisement elsewhere in this issue for more information on this exciting show!

In addition, there will also be an OS-9 Users' Group meeting held during the fest to conduct group business and answer questions from members. This is the medium which the OS-9 Users' Group has found most efficient in communicating and sharing the decision-making process with its members.

Also, you may have noticed that this issue has yet another slightly different look to it. As we continue to play with our publishing and formatting options, please let us know what you like or dislike about the **MOTD**. Carl Boll, our illustrious President, has been handling much of the work for the past couple issues, and deserves much thanks and credit for the layout and style I've adopted for this issue. Hopefully, the changes in style I've made to this publication can be considered improvements. I'm pleased to say I'm finally able to take full editor's responsibility of the **MOTD**, and look forward to working with everyone to keep this newsletter informative.

Sincerely,

*Joel Mathew Hegberg,
MOTD Editor*

VENDOR LISTINGS

The MOTD carries vendor names, addresses, and phone numbers as a service to both our readers and OS-9 vendors. If you are a vendor of OS-9 related hardware or software, you may request to be listed by simply sending a letter to the editor at the Users Group address. There is no charge for being listed in this area. (Vendors who are members are listed in italic type.)

<u>Vendor Name</u>	<u>Address</u>	<u>Phone Number</u>
<i>AniMaJik Productions Software</i>	4650 Cahuenga Blvd.; Ste #7; Toluca Lake, CA 91602	(818)761-4135
<i>Ark Systems USA</i>	P.O. Box 23; Santa Clara, CA 95052	(408)244-5358
<i>Blackhawk Enterprises</i>	P.O. Box 10552; Enid, OK 73706-0552	(405)234-2347
<i>Bob van der Poel Software</i>	P.O. Box 355; Porthill, ID 83853 or P.O. Box 57; Wymndel, BC, Canada V0B 2N0	(604)866-5772
<i>Burke & Burke</i>	P.O. Box 733; Maple Valley, WA 98038	(206)432-1814
<i>Color Systems</i>	P.O. Box 540; Castle Hayne, NC 28249	(919)675-1706
<i>Computer Design Services</i>	2550 Sandy Plains Road; Marietta, GA 30066	(404)973-2170
<i>CoNect</i>	449 South 90th Street; Milwaukee, WI 53214	(414)258-2989
<i>Delmar</i>	P.O. Box 78-5238; Summit Bridge Rd.; Middleton, DE 19709	(302)378-2555
<i>Dirt Cheap Computer Stuff Co.</i>	1368 Old Highway 50 East; Union, MO 63084	(314)583-1168
<i>Disto</i>	1710 Depatie; St. Laurent, Quebec, Canada H4L 4A8	(514)747-4851
<i>Fama Systems PB</i>	P.O. Box 321; Warner Robins, GA 31099-0321	(912)328-7859
<i>Frank Hogg Laboratories</i>	204 Windermere Road; Syracuse, NY 13205	(315)469-7364
<i>Hawksoft</i>	244 S. Randall Road; Elgin, IL 60123	(708)742-3084
<i>JWT Enterprises</i>	5755 Lockwood Blvd.; Youngstown, OH 44512	(216)758-7694
<i>Ken-Ton</i>	187 Greenacres Road; Tonawanda, NY 14150	(716)837-9168
<i>Microware Systems Corporation</i>	1900 N.W. 114th Street; Des Moines, IA 50322	(515)224-1929
<i>Northern Exposure</i>	7 Greenboro Cres.; Ottawa, Ontario, Canada K1T 1W6	(613)736-0329
<i>OS Online</i>	221 E. 17th #31; Marysville, CA 95901	(916)734-4264
<i>Peripheral Technologies</i>	1480 Terrell Mill Road #870; Marietta, GA 30067	(404)973-2156
<i>Sub-Etha Software</i>	P.O. Box 152442; Lufkin TX 75915 or 936 North Twelfth Street; DeKalb, IL 60115-2516	(815)748-6638
<i>Windsor Systems</i>	2407 Lime Kiln Ct.; Louisville, KY 40222	

MAGAZINES

The MOTD also publishes a list of the various magazines (with addresses) that are available which cover OS-9. The same rules apply as above. Newsletters will not be listed here.

<u>Magazine</u>	<u>Address</u>	<u>Phone Number</u>
68' Micros	P.O. Box 321; Warner Robins, GA 30199-0321	(912)328-7859
Metamorphosis	1368 Old Highway 50 East; Union, MO 63084	(314)583-1168
The Underground	4650 Cahuenga Blvd.; Ste #; Toluca Lake, CA 91602	(818)761-4135
Nine Times	5755 Lockwood Blvd.; Youngstown, OH 44512	(216)758-7694
CoNect!	449 South 90th Street; Milwaukee, WI 53214	(414)258-2989

Classified Ads

The MOTD is offering free Classified Ads to all OS-9 User's Group members. In order to place an ad, send in your copy to the address listed inside the front cover, or to e-mail address "JoelHegberg@Delphi.com". Ads should be kept as simple and short as possible. The first four lines will be free, after that all lines will be charged \$2.00/each. Ads will be run for two consecutive issues. You may also send in a camera-ready copy which may be inserted in the ad. Contact the editor for details and pricing.

Ad #1:

Spring Clearance: All CoCo's! 1 CoCo2, 1 CoCo3 512k, 1 CoCo3 1Mb -- in a PC case with a Disto no-halt controller, Tandy printers DMP-105 & DMP-110, Tandy CoCoDos software for 2 & 3, Level 1 & 2 OS-9 8/16 windows. ** I can't give it away. ** Make me an offer!

AMJ, 3 Lynmetestraat, 8730 Oedelem, Belgium. Call +32 50 781950 (office hours MET).

This ad runs for free.

The editor of the MOTD reserves the right to refuse ads or to limit ads due to space available in each issue. If the ad was charged for and not run, we will refund your money. This is being offered as a service to our membership only. Please do not place ads for non-members.



BBS Listings



<u>BBS Name</u>	<u>Location</u>	<u>Baud Rates</u>	<u>Phone Number</u>
ChiCoCo	Chicago, IL	300-2400	(312) 735-3355
Cup of CoCo	Carpentersville, IL	300-2400	(708) 428-0436
SandV	LaGrange Park, IL	300-9600	(708) 352-0948

We apologize for any inaccuracies in these lists. We will add to them as we obtain more information. Please help us out. Send us any information you may have regarding OS-9 BBS systems or corrections to our current listing. *We are here to help serve you, the member.* Let us know of any ideas you may have for improving the quality of our service to you.

Best Wishes,

*Joel Mathew Hegberg, Carl J. Boll, Colin McKay, Brian Goers, Eddie Kuns,
Paul Jerkatis, Brother Jeremy, Howard Luckey, & Zack Sessions.*